



*Memorandum*

April 19, 2001

**TO:** House Committee on Rules  
Subcommittee on Technology and the House  
Attention: Don Green

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**SUBJECT:** Information Technology in the House of Representatives

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In response to your request, I have prepared an updated memorandum on the use of information technology in the House of Representatives and potential implications for House procedures. The issues raised in the original memorandum written by Jane Bortnick Griffith in April, 1999, and the circumstances surrounding them, continue to be relevant and largely unchanged. Governmental concerns regarding the ongoing challenges of electronic formats and issues of authentication, trust, accessibility, and accountability are similar to those in the private sector. For that reason, this update does not revisit these issues in detail. Instead, this update refers to them in the context of issues that have either newly emerged or have significantly changed as the House of Representatives has continued to enhance its technological infrastructure and new opportunities have arisen.

The update contains information about recent technological advances in the House, current implementation concerns, and the status of continuing and emerging issues. The original memo has been included as a reference in Appendix A. Policymakers who are recently becoming familiar with these issues may want to read the Appendix first to get a sense of the evolution of the technology and the issues. Policymakers already closely involved may want to start with the update for the most recent information.

# **Information Technology in the House of Representatives: Trends and Potential Impact on Legislative Process for the 107<sup>th</sup> Congress**

## **Introduction**

Information technology (IT) is rapidly becoming an integral part of governance at the local, state, federal, and international levels. Trends in technology development have the potential to enhance and transform how governments function. In the House of Representatives, the technological changes of the last five years represent an exponentially greater change compared to the previous twenty years. The proliferation of personal computers, the integration of the Internet into our everyday work, and the growth of wireless devices has revolutionized how Americans communicate with government and participate in political activities.

However, while the technology itself has advanced rapidly, efforts to effectively utilize the capabilities of the technology have developed more slowly. The growth of information technology offers a variety of opportunities and challenges to the administration of the House of Representatives and the legislative process. Indeed, perhaps one of the biggest challenges for the House of Representatives is adapting information technology in ways that conforms to the rules and traditions of the institution. In the following pages this memorandum highlights some of the most recent improvements to the technological infrastructure of the House of Representatives, concerns raised by the implementation and integration of information technology into House activities, and continuing and emerging issues the House may need to address.

## **Technological Advances/Developments in the House<sup>1</sup>**

Over the last two years the office of the House Chief Administrative Officer (CAO) has dedicated a significant amount of time, energy, and resources towards maintaining and improving the information infrastructure of the House of Representatives. The available bandwidth for Internet access in the House of Representatives was more than doubled from 10 megabyte (mb) to **21mb/second**, while at the same time improvements were made to increase the robustness and reliability of the House computer networks and e-mail systems. The CAO upgraded the software running the House Messaging System to handle increased volume, improve virus protection, and achieve a 99% availability “up time” during 2000. Remote connectivity was also improved. Faster **v.90** analog<sup>2</sup> and integrated services digital network (ISDN)<sup>3</sup> dial access capability was added for members and their staff. In addition,

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<sup>1</sup> The information in this section is drawn from data provided by the Office of House Information Resources.

<sup>2</sup> **V.90** is a technical standard, approved by the International Telecommunication Union, used for 56 kilobits per second (Kbps) modems.

<sup>3</sup> ISDN is an international communications standard utilized for sending voice, video, or data over  
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efforts to enhance connectivity for district offices (DOs) were also continued through a successful pilot project using digital subscriber line (DSL) technology<sup>4</sup> to connect DOs to the Washington, DC campus data network. End-user support was also increased through the introduction of the House Information Resources (HIR) Call Center in February 1 999,<sup>5</sup> the instruction of 623 training courses, and the initialization of the Correspondence Management System (CMS) evaluation program. Information security has also been a priority through the implementation of a firewall strategy, a House-wide system security audit program, and the completion of the Information Systems Security Program (ISSP) which provides the framework for the House information technology security strategy and establishes the basis for House security policies.

The CAO has also conducted or plans to conduct a variety of evaluation and pilot projects in anticipation of future House IT needs. The CAO is currently developing a pilot project for the use of virtual private networks (VPN). A VPN is a private data network that makes use of the public telecommunications infrastructure, maintaining privacy through the use of a tunneling protocol and security procedures. A VPN may provide a secure and effective environment for Members of Congress, Committees, and staff to collaborate with individuals from remote locations with a high degree of privacy, even over the Internet.

Another area being investigated is the use of wireless technologies. The CAO plans to conduct a pilot project/test of the BlackBerry Enterprise Server in FY 2001. BlackBerry is a personal digital assistant (PDA) that could be used as an extension of the House Messaging System allowing Members and staff to exchange messages and information (documents, legislative drafts, etc.) using these wireless devices. In the Senate, some Senators are hoping to use wireless hand-held computers in conjunction with an intranet<sup>6</sup> to post the contents of recess packets, including position papers, issue briefs, and news releases, which the Members could then download to their PDA or laptop to reduce printing costs (and the weight of their briefcases).<sup>7</sup>

Efforts by the CAO are also underway to implement information technology solutions to enhance the efficiency and effectiveness of the day-to-day operations of Representatives' offices. The deployment and addition of new features to Procurement Desktop (PD) are helping move procurement further toward the paperless office. Procurement Desktop is electronic procurement software used by some offices in the House of Representatives to purchase items such as office supplies, computers, and special furniture. The anticipated implementation of a new staff Human Resources (HR)/Payroll system by the end of the 107<sup>th</sup> Congress should also help streamline various HR procedures, enable employee self-service of benefits, and improve the management of employee records.

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<sup>3</sup> (. .continued)

either digital or copper telephone lines at data rates up to 128-Kbps.

<sup>4</sup> DSL technologies use sophisticated modulation schemes to compress data using standard copper telephone wires, providing high-speed Internet access.

<sup>5</sup> The call center received and responded to 66,556 calls during the 106<sup>th</sup> Congress.

<sup>6</sup> An intranet is a network accessible only by the organization's members, employees, or others with authorization.

<sup>7</sup> William Matthews, "Republican Palm Push," *Federal Computer Week*, 26 March 2001, [<http://fcw.com/fcw/articles/2001/0326/web-sen-03-26-01.asp>].

## **Implementation and Integration Trends and Issues**

With technological changes taking place on many fronts, there are a number of legislative and logistical concerns that may need to be addressed in the near future. These include the standardization of information technology resources, mediating differences in the expectations of information technology investments, and resolving questions regarding the purposes of implementing information technology solutions in the House of Representatives.

### **Provision and Standardization of Information Technology Resources and Services.**

One issue involves the provision and standardization of information technology resources and services. Policymakers may ask: How should the costs of IT in the House be distributed? What is the “standard level” of resources and services that all Representatives should receive? How active should the House information technology staff be involved in supporting district offices? Is the more decentralized model utilized by the Senate feasible or desirable in the House of Representatives? What is the difference between technology “needs” and “wants”? The House of Representatives is continuing to support a centralized information infrastructure for all its Members such as network support, e-mail, and security. To date, the House of Representatives has strived to develop cost models that accommodate both the “power users” and the less technologically-intensive offices. Additional services such as higher speed connections for DOs and correspondence management systems (CMS) are also contracted for and made available to Members of Congress who wish to buy into them. As efforts progress, standardization of document formats and data handling procedures may become necessary as Committees and congressional offices become more responsible for submitting materials electronically to be part of the “official” record.<sup>8</sup>

**Differences in Expectations of Technology Investments.** Another change taking place involves user expectations of technology investments. As the technology continues to mature and users’ experiences broaden, the emphasis of information technology investments is beginning to shift from efficiency to value added capabilities. Although efficiency goals continue to be important, the interest in qualitative change is an influential motivating factor for adopting new information technology solutions. For example, the adoption of wireless enabled PDAs, such as the BlackBerry, not only to have the potential to reduce the amount of paper used to print and distribute documents, but also to have the potential to enhance the mobility and accessibility of Members of Congress and staff. Rather than being dependent on their proximity to their Washington, DC offices for information and communications, users of these devices will be able to travel to their districts and other locations while still being engaged in the issues and activities being handled at their offices.

**Purposes of Information Technology.** Related to the issue above, the enhanced capabilities of information technology and the expanded possible uses has highlighted unresolved questions regarding the purposes of the technology. Some policymakers may ask: To what end should information technology be used in the House of Representatives? Some observers see the primary value of information technology as an improved means of

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<sup>8</sup> See Appendix A, p. 15.

providing access to House information for record-keeping purposes. Advocates of this position suggest that the purpose should be to improve the efficiency of the information dissemination process by reducing the need for paper printouts and maintaining a digital record that is always available at any time of the day. In contrast, other observers emphasize the possibility of enhancing the openness of House activities. For example, broadcasting hearings in digital video and audio in real time with the files archived on a web site immediately following the hearing. This, in turn, has implications for practices such as the Representatives' ability to amend their comments and the addition of follow-up responses to questions posed by Members of Congress after the hearing. Differences of opinion regarding the purpose of using information technology in the House also relates directly to the ongoing issue of what is considered the "official" record.

## **Continuing and Emerging Issues**

While the issues raised above and in Appendix A have not disappeared, some have become more salient and new issues have emerged as information technology has grown to play a larger role in the operations of the House.

**Leadership.** One of these issues is the question of leadership of internal House information technology issues. Who may be responsible for coordinating the overall information technology policy of the House of Representatives? How are these policies being set? What forces drive the use of information technology in the House of Representatives? Should the House of Representatives consider establishing a chief information officer (CIO) for itself?

Large information technology projects such as the introduction of new infrastructure or the upgrade of enterprise systems often require significant planning and preparation over an extended period of time. The success of such projects relies heavily upon the management and maintenance of information technology resources. At the present, it appears the Committee on House Administration is taking the lead on internal House information technology issues. This includes oversight of the office of the Chief Administrative Officer (CAO), which is responsible for carrying out much of the maintenance and upgrades to the House information technology infrastructure. A review of the CAO's major technology initiatives suggests a comprehensive blueprint for information technology projects in the House, including multi-year implementation plans and pilot projects anticipated through FY2002.<sup>9</sup> The "push" for technology by the Committee on House Administration is joined by a "pull" for continued information technology improvements by some Representatives. New Members of Congress are often a source of demand for information technology capabilities as they are accustomed to using information technology in their previous jobs and expect to implement similar resources in their roles as Representatives.

**Transparency and Trust.** An issue of rising importance to policymakers is the transparency of the information being used to create the online databases and electronic documents. In this context, transparency refers to the ability to accurately trace and verify the source of a document or other piece of information. Who controls the information? Where does it come from? Is there a need for an unbiased arbiter to coordinate the flow of

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<sup>9</sup> Source: Office of House Information Resources.

information into the online databases? The acceptance of electronic documents as legitimate policy instruments is heavily dependent on their perceived authenticity and reliability. To achieve these qualities, characteristics such as their source, author, and version must be clearly established and verified. In addition to contributing to the legitimacy of online information, transparency is also related to concerns over trust in information technology. Trust, as it relates to information technology, usually refers to one's confidence in the reliability and dependability of the physical infrastructure. This is an important concern when trying to build support for a shift to a more technologically enhanced and dependent environment, such as the movement/adoption of electronic government. However, trust is also important to convince users of the integrity of the information they are using. Documents that have been submitted through the appropriate channels to ultimately be printed by the Government Printing Office (GPO) or other sanctioned printer carry an imprimatur of legitimacy that electronic documents from other sources do not necessarily have. How then does one verify the authenticity of a document? Should the GPO solely be responsible for producing government electronic documents? What processes should be established to ensure the transparency of information?

**Archiving Information.** The archiving of electronic information is a rapidly growing problem government-wide. The proliferation of various media formats (audio, video, text) and the uneven use of web sites, e-mail, and other means of communications, create many challenges to maintaining the public record. How can one keep track of what information is made available electronically? How does one decide what information should be archived and how to make it available to the public? What happens to the information as electronic formats become obsolete and potentially unreadable? Some committees and individual Members extensively utilize electronic resources to communicate with their respective constituencies. Some committees stream live audio and video feeds of hearings over the Internet and post documents that can be downloaded. However, the House as a whole has not yet addressed the issue of archiving digital audio and video resources.<sup>10</sup> Other committees are less enthusiastic and rely more on traditional means of providing information. Some Members of Congress make active use of e-mail and web sites to respond to inquiries while others prefer to send written letters and press releases. Maintaining these records in varying forms but at a comparable level of detail is a challenge. The National Archives is attempting to preserve executive branch web sites between the changes of Administrations. Some policymakers may ask: Does Congress need to make similar attempts between sessions?

**Digital Signatures.** The use of digital signatures is another issue of rising importance to the House of Representatives. A digital signature is a code that is attached to an electronically transmitted message that uniquely identifies the sender. The purpose of a digital signature is to guarantee the authenticity of the sender. Digital signatures are currently not in use in the 'House. However, the CAO plans to conduct technical evaluations of digital signatures and other electronic authentication methods, such as biometrics", in FY2002. Digital signature technology has the potential to allow Members to electronically carry out responsibilities that they currently do in person or in written form. However, the

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<sup>10</sup> Source: Committee on House Administration.

<sup>11</sup> In computer security, biometrics refers to authentication techniques that rely on measurable physical characteristics, such as fingerprints, voice patterns, or retinas, that can be automatically verified.

potential use of digital signatures also directly challenges some of the assumptions regarding Members' actions and the delegation of authority. Who will have authority to use a digital signature for a Member or a committee chair? In what cases does a Representative actually sign documents today as compared to a staff person employing a signature machine or signing for the Member of Congress? Do current rules governing requirements for Representative signatures adequately transfer for electronic documents?

## **Appendix A: Information Technology in the House of Representatives: A Historical Framework of the Trends and Potential Impact on Legislative Process for the 104<sup>th</sup> - 106<sup>th</sup> Congresses**

### **Foreword**

The information in this appendix was originally prepared in a memorandum to the House Committee on Rules by Jane Bortnick Griffith on April 12, 1999. It provides an overview and background of the state of the congressional technical infrastructure and plans for enhancements at that time. It also identifies a number of areas where the use of computers and telecommunications may impact the way the House of Representatives operates. It has been slightly revised to reflect changes in information.

### **Background**

The House of Representatives relies heavily on information technology to improve the efficiency of its internal operations, to enhance Member and staff access to information useful in the legislative process, to facilitate the production of legislative documents, and to communicate more effectively with constituents and the general public. While the application of technology is only one factor among a variety of social, demographic, and political trends that influence the political process, it has the potential to significantly impact legislative processes.

This analysis provides an overview of the current technical infrastructure in the House of Representatives, identifies plans for future technical enhancements, outlines major trends in information technology that have potential application to House activities, and discusses implications for legislative procedure. The final section will raise several questions: How will changes in document preparation and the publication of congressional material affect legislative processes and the historical record of the institution? What impact might communications technologies have on the way business is conducted on the floor, in committees, and among Members? What are the implications of more extensive use of technology by the Congress and the public for changing interactions between Members and their constituents?

### **Current Technical Infrastructure**

Computers, telecommunications, and video technologies are pervasive throughout the House of Representatives. Certain systems, such as electronic voting, video coverage of floor proceedings, and legislative information tracking, have been in existence for many years and continue to be improved as new technologies become available. Use of personal

computers (PCs) and networks make it possible to approach existing operations in new ways and they also impact the way offices operate, information is shared, and individuals communicate. The Internet and the development of the World Wide Web have radically changed the ability of Members of Congress to disseminate information to the public and to receive input from their constituents.

In the 104th Congress, the Committee on House Oversight undertook a major “CyberCongress” initiative to upgrade the House systems: The objective was to ensure that all Members and committees have “a robust, coherent, unified, multimedia computer network, with sufficient software and modern compatible equipment, with which the U.S. House of Representatives may effectively function to best serve the American public, the Members of the House, and other government institutions.”<sup>12</sup> Enhancements continue to be made so that all Member and committee offices have access to high speed transmission facilities and multimedia capabilities. Connections between a Member’s Washington and district offices are now integrated into the House-wide network, enabling district office staff to access information on the internal House systems and to communicate more efficiently with Members. Continued expansion of the wide-area networking capability in the House supports Internet access, secure dial-in access, network connectivity, and private lines to each Member office. The Campus Network Infrastructure enables connectivity between buildings and offices throughout the House, linking all computers in the House for automated scheduling and messaging.<sup>13</sup>

The House Messaging System provides e-mail and scheduling services to approximately 10,000 users and is an essential component of the technical infrastructure. Statistics indicate that the system processes approximately six million mail and schedule transactions per month. The amount of data that moves through the system each month is equivalent to approximately 18 million pages of text. The technology that supports use of the Internet and the World Wide Web also plays a major role in the House. The House’s Web servers and software maintain the House Internet Web site and the House Intranet. They host over 400 Member Web sites, as well as 19 full committee Web sites, and receive as many as 40 million hits per month from the public.<sup>14</sup>

The House relies heavily on the Hill’s legislative information systems to access key congressional documents and to disseminate them to the public. At the request of then Speaker Newt Gingrich, the Library of Congress developed the Thomas system to provide public access via the Internet to information about pending legislation. Thomas continues to offer an expanding amount of legislative material to the public and is considered among the most popular of federal government Web sites. Underlying Thomas is the Legislative Information System (LIS), available internally to congressional offices. The LIS was created in response to requests from the Legislative Branch Appropriations Committees for the Congressional Research Service (CRS) and the Library of Congress (LC) to reduce duplication of legislative information systems on Capitol Hill and build a new retrieval

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<sup>12</sup> *CyberCongress Accomplishments During the 104<sup>th</sup> Congress*. Presented by the Computer and Information Services Working Group to the Committee on House Oversight, February 11, 1997, p. 1.

<sup>13</sup> Testimony of Jay Eagen, Chief Administrative Officer, U.S. House of Representatives to the Subcommittee on Legislative Appropriations of the House Committee on Appropriations on the Fiscal Year 2000 Budget Estimates for the U.S. House of Representatives, February 1, 1999.

<sup>14</sup> Source: House Information Resources.

system to serve the needs of Congress. The Committee on House Administration and the Senate Committee on Rules and Administration are responsible for oversight of the LIS. The first release of the LIS retrieval system was made available at the start of the 105th Congress, and it has continued to expand both in terms of the amount of legislative information available and its search capabilities.

The LIS and Thomas now include bill summary and status information beginning in the 93rd Congress, text of bills beginning in the 1st Congress, ***Congressional Record*** beginning in the 101st Congress, CRS reports and public policy literature files, reports of the Congressional Budget Office and the General Accounting Office, recorded votes, committee reports, and selected congressional hearings, as well as connections to other House and Senate data and other sources of legal and legislative information. The LIS contains additional information restricted to use by congressional offices, including subscription services for commercial databases and internal systems of the House and Senate. Thomas offers a public portal to the workings of Congress and to House and Senate proceedings. Committee and Member Web sites distribute additional material on their activities. For example, the results of House votes are available on the same day that they occur and a growing number of electronic hearings transcripts and witness statements can be viewed via the Internet.

Audio and video capabilities in the House also play a major role in public access to Congress. Television coverage of the floor proceedings has existed for many years, along with C-SPAN coverage of selected hearings. Members make routine use of video technology for communicating with constituents and providing material for the news media. Video conferencing technology is now available in a growing number of offices in the House, as well as centrally within the House recording studio. The major breakthrough in this area is audio and video distribution over the Internet. The potential use of these technologies for Congress is only beginning to be realized.

In the last Congress, several committee hearings were “cybercast” over the Internet, allowing real-time remote access to those proceedings. In the 106th Congress, the Committee on Agriculture provides audio coverage of its hearings over the Internet. The Committee on Science currently is testing use of live Internet broadcasting of its hearings. The Committee upgraded the technical infrastructure of one of its hearing rooms to allow for greatly enhanced multi-media capabilities. Each Member’s dais area includes enhanced audio and data ports for computer access to the House system. The hearing room has a retractable projector mounted in the ceiling, a drop-down screen for Member viewing, two wall mounted flat screen TVs for audience viewing, TV/monitor for witness’ viewing, flat touch-screen TV at the Chairman’s seat to view presentations or cable TV, and three wall mounted cameras. An operator’s console is capable of video conferencing, overhead projection, mounting prepared presentations on a laptop, video and audio tape presentation and recording, Digital Video Disc (DVD) presentation, access to the Internet, and distribution of live audio/video feeds via the Committee’s Web page. A second hearing room is equipped to act as an overflow room, and has a subset of the above audio and video capabilities.<sup>15</sup>

### **Plans for Enhanced Systems**

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<sup>15</sup> Information provided by the House Committee on Science.

The House of Representatives is continuing to upgrade and expand its technical infrastructure to take advantage of faster processing and communications speeds, greater storage capacity, software enhancements, and new products and services. At the same time, more individuals in the House are connecting to networks, systems are becoming easier to use, Members and staff are more comfortable with technology, and technology is being applied to more office operations. The continuing growth curve for use of **email**, both for internal and external communication is reflected in the statistics cited above on the millions of messages currently processed each month. As Members and committees become more sophisticated in their use of technology, their use of the Internet and the World Wide Web --for communicating with the public about the activities of the House and for interacting with constituents--can **similarly** be expected to grow. The millions of times Web sites are accessed by the public are indicative of how Members and committees already employ the Internet as a major mechanism for disseminating information to the public. The increasingly heavy reliance on digital technologies for performing basic tasks associated with both legislative and representative functions in the House has important implications for resource requirements and methods of operating.

The LIS and a planned new electronic document management system (DMS) are integral to House plans for enhancing the use of technology for legislative operations and for increasing public access to the proceedings of the House. Several goals were articulated for enhancing the LIS retrieval system during 1999 and 2000.<sup>16</sup> They include providing access to legislative information from the authoritative source for that information as soon as it is made available and providing a coordinated retrieval system that supports initiatives to reduce duplication of effort and improve efficiency in the legislative tracking systems supported by Congress. In addition, plans call for adding more committee-generated documents and information, integrating more commercial and non legislative branch information sources, and analyzing requirements for multi-media material.

The Offices of the Clerk and the Legislative Counsel are extensively involved in the development and implementation of a new DMS. As stated by the Clerk of the House in recent testimony, the overall goals of the DMS are:

- To improve the legislative document creation and revision process.
- To provide pro-active tracking, routing, and control of legislative documents.
- To improve information exchange with the Senate and other government entities in order to facilitate the legislative process.
- [To] enable the Office of the Clerk to become the repository for House legislation and related documents for current and future use, for the general public, legislative organizations, and the House of Representatives.
- To allow the House of Representatives to become more independent for preparation, printing, and distribution of official House of Representatives documents.<sup>17</sup>

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<sup>16</sup> Congressional Research Service, Library of Congress, *The Legislative Information System: 1999 Objective and Plans for the Retrieved System*, November 30, 1998.

<sup>17</sup> Statement by the Honorable Jeff Trandahl, Clerk of the House Before the House Appropriations Subcommittee on the Legislative Branch, February 1, 1999, p. 5-6.

The full implementation of the House DMS is part of a Hill-wide effort to facilitate publication of legislative documents on the Internet, provide for more current retrieval of legislative information, and allow for more rapid exchange of documents without having to convert them to different formats. This will enable Congress through a single source to have immediate access to core legislative documents, receive information on -actions taken in committees and on the floor, and link to a wide range of information resources that are relevant to issues on the legislative agenda. Similarly, by rapidly making much of this information available via Thomas, there will be greater public access to ever-increasing quantities of legislative information.

Initial efforts in building the new DMS include creating a common set of document type definitions with the Senate, Government Printing Office, and the Library of Congress; beginning testing of text editing and document management software; acquiring needed hardware and software; and completing a requirements analysis.

### **Trends in Information Technology**

The rapid pace of technological change produces computers and networks that continue to operate faster, handle larger amounts of information in multiple media, are increasingly "user friendly," and generate new products and services. The House already has experimented with giving the new Members of the 106th Congress notebook-sized computers that enabled them to access the House network as they prepared to take office. While Congress is not likely to be an early adopter of the most advanced technologies, it will likely be interested in those systems and capabilities that become generally accepted in the business and consumer market.

An increasing amount of developing technology and services may be useful to Congress, since it is an institution that is dependent upon effective communications and the ability to produce, process, and maintain large amounts of very current information. The availability of commercial-off-the-shelf (COTS) software and systems and the use of open standards that promote interconnectivity allow for more rapid adoption of new technology and reduce the time required for in-house systems development. These trends may result in more potential for applying information technology to House operations and for more rapidly adopting technologies than has occurred in the past. This section will discuss several areas that may have particular utility in the House of Representatives.

**Wireless communications.** The growth of wireless communications offers great potential in the congressional environment where mobility is essential. Members' use of paging devices and cellular telephones is now commonplace and a key way that communication occurs in the House. Several trends in wireless technology have the potential to expand those capabilities in new ways. One of these is the growing availability of digital wireless systems, such as digital cell phones, which provide greater security and enhanced capabilities.

Wireless connections that link PCs or other devices to communications networks and the Internet will make it possible for Members to connect to office information, email and scheduling systems, the House network, and other important data while traveling or away from installed wiring. While wireless service is not yet available in all locations, and standards are still under development, deployment of secure wireless communications in

more settings is on the rise and congressional use will likely mirror growth in the commercial sector.

**Computing and Communications Devices.** Several trends in hardware and software are producing computing and communications devices that are smaller, better designed, and offer greater functionality. Researchers continue to explore such concepts as “ubiquitous” computing where computing and communications capabilities would be built into physical environments in much the same way that power sources are today. Embedded computer chips already are pervasive in appliances and other equipment. What lies ahead is the ability to link and control those devices via communications networks.

Increasingly smaller devices, such as “wearable” computers and handheld equipment that combines both computing and communications functions are under development. Electronic “white boards”, desktop video conferencing, and thin screen monitors provide other examples of how improvements in the size of hardware components, advances in software, and increasing communications bandwidth will make collaboration easier for users in Congress. The commercial goal is to make computing and communications so easy and accessible that it will become integrated into everyday activities and commonplace in all settings. While an increasing number of Members use pagers, cell phones, and notebook sized PCs, the routine use of computers by a majority of lawmakers within Congress is still in the future. However, as new generations of legislators come to Congress and progress continues in reducing the size and increasing the functionality of computing devices, their widespread use by Members themselves is likely to grow.

**Multi-Media.** As noted above, the House of Representatives has used video technology for many years. Televised coverage of the proceedings of the House to the general public began in 1979. It remains one of the primary ways that the public views the workings of the Congress. Over the years, video technology became more pervasive at hearings and has been employed routinely by Members to provide statements to their constituents and the press. Video conferencing has been used to experiment with conducting hearings involving witnesses at remote sites and for holding town meetings with constituents. Among the newest developments is the distribution of video coverage of hearings over the Internet, as is currently being developed by the House Committee on Science.

Multimedia integration of audio and video with text is becoming increasingly common and offers possibilities for providing access to related congressional information in different formats. For example, if someone were reading an online version of the *Congressional Record* and wanted to view the corresponding video segment of the Member making a statement, the different formats could be linked. Digitized audio and video may expand the capabilities for searching audio and video material as well as text information. Research into speech recognition continues to progress and the development of new products that utilize some type of speech recognition is growing. The ability to use machines to identify and access specific portions of audio and video material has considerable potential for congressional applications.

**Networking.** Among the most dramatic changes that technology has brought is the ease with which individuals, institutions, and machines can now communicate. While computer networking has been developing for decades, the combination of a greatly expanded installed infrastructure, the phenomenon of the World Wide Web, and the enormous increase in information available on the Internet has produced a global

communications revolution. Estimates vary, but a recent analysis suggested that over 88 million people in North America and over 158 million people worldwide are **online**.<sup>18</sup> Research by the Yankee Group estimates that two-thirds of U.S. households will have Internet access by 2003, compared to about one-third by the end of this year. They noted that the availability of low cost PCs is driving the rate of penetration.” The concept of universal connectivity--whether among individuals or between people or between computing and information resources--is now being realized, but the implications have yet to be fully recognized.

The expansion of wireless technologies and services furthers the ubiquity of networking by providing links when people are mobile and by connecting geographic areas where installation of fiber wires would be too expensive. The growth of non-PC devices, including such things as web appliances and network computers are changing the way systems designers are thinking about how they will make data available to potential users. Under exploration are new types of operating systems, network configurations, and applications that rely less on the PCs to perform higher level functions and more on the capabilities built into the network. Developments of this kind may further **simplify** use of networks and reduce the costs to PC users. The integration of voice, video, data, and text as digital streams traversing the same network also opens up new possibilities for economically providing a broader range of services **from** a single source.

### **Implications for Legislative Procedures in the House**

Use of information technology in the political process continues to grow rapidly. Effective deployment of computer and communications technologies can streamline operations within organizations and institutions and allow for greater flexibility in how tasks are performed. These changes can affect all levels of the organization--from individual offices to the entire House of Representatives. The Internet and the creation of Web pages also provide opportunities for more immediate and continuous interactions between the public and individual Members, committees, and the whole Congress. As the previous sections illustrate, the House of Representatives has already made a substantial investment in information technology and has plans to continually enhance its capabilities. Combined with the trends in the commercial marketplace for new products and services, the potential for information technologies to have significant implications in the congressional environment warrants analysis. The topics below reflect several areas where new modes of operating **may** impact existing House procedures and raise issues for consideration by the Rules Committee.

It should be noted that the existence of new products and services will not automatically result in the House's adoption of them. Other factors, such as whether Members and staff are comfortable using those technologies, if they meet the designated requirements, and how well they fit into the "culture" of the House, are critical to their acceptance. Willingness to rely on new technologies also will depend on their reliability and security. Increasing reliance on computing systems and networks raises questions about the trustworthiness of these technologies and how dependent an institution such as the House of Representatives may wish to be on systems that may fail to operate as and when needed. The requirements

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<sup>18</sup> Nua Internet Surveys. <[www.nua.net/surveys/how\\_many\\_online/index.html](http://www.nua.net/surveys/how_many_online/index.html)>

<sup>19</sup> <[www.nua.ie/surveys/?f=VS&art\\_id=905354802&rel=true](http://www.nua.ie/surveys/?f=VS&art_id=905354802&rel=true)>

for adequate security against unauthorized access to and appropriate safeguards against misuse of House systems present another major challenge to be addressed before new capabilities are implemented.

**Document Preparation.** The use of computers to prepare legislative documents and print them, combined with increasing use of networks for exchanging text and distributing documents, -already has affected the speed and process of preparing bills and committee reports. For example, the House Legislative Counsel's office distributes drafts and final versions of bills and amendments to sponsors and committee offices almost exclusively through the House electronic mail system. Maintaining a separate **email** server within the Office of the Legislative Counsel and sending the documents directly through the House Information Resources mail server are important to maintaining security **in** transmitting drafts electronically. By using the PDF file format, alterations to the text can be prevented, while the visual representation of lines, numbers, and other formatting requirements are maintained--an important consideration when relying on electronic versions of bills.<sup>20</sup>

A "state of the art" document management system will make document preparation more efficient, but may also raise important issues about the further transition to a more comprehensive electronic environment. Authentication of documents is a key issue. Electronic signatures are an important mechanism for verifying the source of the information and the integrity of the content. Improvements in this technology--combined with the development of an infrastructure within the House and Hill-wide that can support electronic signatures--will make their use increasingly feasible. Having the technical capacity to enable widespread use of digital signatures, however, resolves only part of the issue. For example, how will Congressional offices ensure that only authorized staff have access to digital technology? Who will have authority to use a digital signature for a Member or a committee chair? In what cases does a Member actually sign documents today as compared to a staff person employing a signature machine or signing for the Member? Are current rules governing requirements for Member signatures adequate or workable for electronic documents?

The transition to an electronic document system has other implications. A major issue is the reduced time for the deliberation process. The use of computers makes it possible to put draft material into a format that appears to be "final" very rapidly. Yet, the appearance of a correctly formatted document may mask the fact that there has been little time to analyze or validate the content. The ability to "cut and paste" text from one document to another might improve the consistency of legislation over time, but also could result in increasingly lengthy documents. As legislative text moves more seamlessly from initial drafts through **final** publication, one loses the time between each stage of the process that historically has been available for further consideration of the wording and for performing quality control.

As more of the work that underlies document preparation and distribution is streamlined through the DMS, there will be more opportunity for the direct transmission of electronic versions of bills and amendments. The issue of accessibility to computers and printers by Members when they are in the House chamber is another relevant issue. Theoretically, Members could send an **email** to their staff or to the Legislative Counsel requesting that an amendment be drafted; the electronic version could be sent back instantly. Will rules and

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<sup>20</sup> Interview with Office of the Legislative Counsel, U.S. House of Representatives.

procedures that are tied to traditional modes of operation require reexamination? Will rules need to be changed to allow for greater use of technology?

**Publication of Legislative Documents.** While there is a push to make document preparation more efficient through an electronic management system, there is a comparable pull to get faster access to congressional documents through Web publishing. Since documents that originate in digital form do not have to be converted or re-keyed, the time for publication is reduced and the options for electronic distribution enhanced. The use of formatting standards also contributes to improving the publication process—both print and online. For example, offices in the House, Senate, Library of Congress, and Government Printing Office (GPO) involved in the preparation and publication of legislative documents have developed a common set of Standardized Graphical Markup Language (SGML) “tags” to describe the core components of legislative material (e.g. sponsors and date of introduction). Using this common set of tags will facilitate the printing process and establish standardized descriptors that are used throughout the legislative branch.

A derivative of SGML, Extensible Markup Language (XML), is specifically designed for online publication on the Web. XML tags are now under development for use with legislative information. Using SGML and XML tagging shifts the focus to the main components or concepts in a document, rather than its particular typeset appearance; their use also expands the possibilities for different types of displays and permits enhanced retrieval capabilities. In the future, contributions to congressional documents, such as testimony or agency reports to Congress, may all use these standards.

The shift to electronic publication raises several other issues. It is no longer clear, for example, what a “document” is in the online environment. Web pages often contain links to other sources of information that may be essential to conveying the full message. For example, references in bills to existing statutes might be linked to the actual text of the U.S. *Code*. Are collections of linked web pages considered documents? If so, how will they be maintained when the House may not have control over material contained in databases at diverse locations? Another challenge is how to deal with archiving the electronic records of the House. Will it be necessary to continually move electronic information to new hardware and software as the technology develops? Who will be responsible for collecting and preserving electronic versions of congressional documents? What will be the role of committees, the Office of the Clerk, the House Librarian, the Library of Congress, and the Government Printing Office for maintaining the long-term accessibility of electronic congressional records?

Multiple formats also force the issue of determining what is considered the “official” version of congressional material and whether online publication satisfies the current requirements in the rules to print documents. For example, there are now three versions of the floor proceedings available within a day—the daily printed version of the *Congressional Record*, the online version, and the video (C-SPAN) version. Since Members may amend and extend their remarks in the *Congressional Record* and correct any errors that exist in the text, an official corrected version of the proceedings is produced when GPO prints the permanent bound version of the *Congressional Record*. The final bound version, however, is generally not printed until several years later.

In contrast, it is possible to make corrections to the online version of the *Congressional Record* very quickly. A corrected online version would be more accurate than the printed

daily version of the *Record* and available in a much more timely manner than the bound version. Also, given the broad public access to the *Congressional Record* over the Internet, the imperative for publishing an accurate version more quickly becomes even greater. Historically, the printed version has been considered the official version, although it is the certification by the Clerk of the House that actually makes the document official. Another element of complexity may be added by potentially integrating the video recording of the floor proceedings with the text to provide for a multi-media version of the *Congressional Record*. As committees publish more of their hearings and mark up information on the Internet and release video coverage of their proceedings, they will be faced with similar questions. What relationship needs to be established between printed, online, and video versions of the *Congressional Records*? What criteria should be used for determining "official" versions of all congressional documents?

Determining the authenticity and designating the status of the various versions may be increasingly **important** as reliance on electronic versions of the *Congressional Record* and other legislative material increases and the need for paper copies is reduced or eliminated. For example, former Speaker Newt Gingrich made the text of the Balanced Budget Agreement of 1997 available over the Internet and the House vote was taken on the measure before it was ever printed.<sup>21</sup> While the result was broad and rapid public access via the Internet to information related to the budget agreement, some Members expressed concern that printed copies were not available and that the electronic version disseminated was accessible only from a computer controlled by the leadership. Will the rules need to allow for Member's individual preferences for receiving legislative information or will they dictate specific required formats?

As the demands for immediate access to information increase and the costs to print information on-demand in a distributed manner continues to decline, reliance on centralized printing from the GPO may also diminish. There has been considerable debate about the value of maintaining centralized printing facilities for official government documents, including those produced by Congress. Some argue that it is still the most cost-effective to capture the benefits of the economies of scale provided by a single printing operation and that central control provides the greatest assurance that documents will be available to the public. Others maintain that the changing technologies-both for printing and for making documents accessible online-offer greater efficiencies and broader opportunities for public access. If the House asserts greater control over the printing of its documents, how will issues of validating, distributing, and preserving the official record of the Congress be addressed?

**Committee Activities.** Resolution of these issues also is important for committee documents, such as hearings. More of these materials are being made available electronically. The House adopted a new rule (Rule XI, clause 2e) at the beginning of the 105th Congress stating that "each committee shall, to the maximum extent feasible., make its publications available in electronic form." Many committees request that witnesses provide their testimony electronically as well as in printed form so that it can be quickly made available on their Web sites. Some committees also provide access to hearing transcripts on their Web sites. As discussed earlier, committees have begun to experiment with audio and video coverage of hearings on the Web. Will fewer Members attend hearings

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<sup>21</sup> *Congressional Record*, May 16, 1997, p. H2795.

if they can follow them from their offices? Will more Members participate because they know that the hearings will receive broader video coverage? Could a Member watch a hearing remotely and then **email** a question to a colleague at the hearing to ask on his behalf? How will visual materials be incorporated into electronic committee records? Will committees continue to produce printed versions of hearings if they can publish them on the Web? Who will be responsible for maintaining electronic committee records beyond a given Congress? Will the new rule adopted in the 105th Congress provide adequate guidance on electronic publication of committee documents?

Committees are governed by the rules they establish at the beginning of each Congress and they differ on such issues as publication practices and distribution of committee documents. These differences are likely to be more visible in an electronic environment and may raise questions concerning the consistency of handling committee material. Will the right of committees to control their own processes be challenged in this environment? Access to legislative information via the Internet has already increased public expectations for more rapid online publication of committees documents. For example, advocacy groups have called for providing online access to the Chair's mark before the committee vote is taken. The time gaps that traditionally have existed as drafts were revised, bills marked up, and committee reports prepared--time which is often used to reach compromises, eliminate errors, and consider alternatives--may be lost if electronic versions of bills are rapidly composed and placed on Web sites. Conversely, increased public exposure to the process may permit citizen input to be more directly considered during committee deliberations.

Committees might use technology in a variety of other ways. Preparation of briefing books for hearings and mark-ups could be done electronically, reducing the need to print large numbers of paper documents. An electronic briefing book might contain links to distributed resources and would allow a Member to navigate more effectively through the material. Software tools and networks that support collaborative work would enable Members to revise drafts without needing to come together in the same location. One might envision "virtual" committee mark-ups and reporting of bills that use networked systems for remote access and instantaneous updating. The multiple demands on Members' time may make it very attractive to be able to contribute to committee consideration of legislation without having to be in a committee room at a specific time. What would the requirements for authentication of documents and maintenance of quality control over the revision process be in such a setting? What type of participation might be permissible electronically? For example, should electronic **voting systems** for committees be developed and should Members be allowed to vote remotely? How would rules governing proxy voting or quorum requirements be affected? Could a Member offer an amendment remotely or could he **email** an amendment to a colleague to be offered?

**Chamber Activities.** A previous 1997 report prepared by CRS for the Committee on Rules analyzed the issue of electronic devices on the House floor and the potential impact on the existing rules of the House.<sup>22</sup> That report assessed the impact on decorum, the effect on deliberations, and the loss of "sanctity" within the House chamber if Members were allowed to bring laptop computers to the floor. As devices become smaller and wireless

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<sup>22</sup> "Electronic Devices in the House Chamber: An Analysis" prepared by Jane Bortnick Griffith, Specialist in Information Technology Policy and Walter J. Oleszek, Senior Specialist in American National Government, Congressional Research Service, November 2 1, 1997.

technology improves, the question of Members bringing small computers to the House floor may arise again.

What the discussion about laptops on the floor highlighted was the tension between maintaining an environment where Members can deliberate without interference from external influences and ensuring an open process where public participation is enhanced. Would Members be inundated with **email** by lobbyists and constituents during actual floor debate if they had wireless devices on the floor capable of receiving messages from individuals outside the chamber? Conversely, would they be better able to access information that might contribute positively to the deliberations underway? Increasing the use of information technology on the floor also raised questions about the trade-offs between efficiency and the desire to maintain the **collegial** environment within the chamber. For example, if Members could bring laptops to the House floor, they might make more effective use of their time during quorum calls or other business that may not require their direct involvement. Yet, the time Members spend on the **floor** might be better used as an opportunity to interact with colleagues, than for conducting office business.

Another issue revolves around voting procedures. Technically, Members would not have to be present to register their vote electronically. The electronic voting system currently makes use of small identity cards, similar to credit cards, for registering votes. The issue of security and authentication might be addressed through a variety of options, ranging from digital signatures to biometric verification (digital fingerprints or retinal scans). In the **future**, one might be able to convene a “virtual” House and conduct votes without Members being physically present. There seems to be little support among Members, however, for the idea of voting remotely and strong sentiment in favor of coming together to debate and vote on legislation.

Some question whether the sentiments against allowing more technology on the floor reflect more image than reality of how the floor operates today. They maintain that very little deliberation occurs any longer on the House floor, given the role of television and the tendency for Members to arrive on the floor to make a prepared public statement on pending legislation rather than to engage in an open give-and-take debate on the topics. The potential for technology to influence floor deliberation has already been demonstrated by the impact of televising the proceedings. How might the role of other technologies and the integration of video with computer networks further alter the environment on the floor? Would it diminish or enhance the legislative process? Would technology differentially impact discrete lawmaking stages?

**Communications.** Networked communications are transforming the way people interact and exchange information. The expansion of telecommunications infrastructures--in terms of the installation of equipment, provision of services, and numbers of users--continues to grow at an enormous rate. The explosion of the Internet and the World Wide Web, the increased availability of wireless communications, and the transmission of multi-media information have been mentioned in previous sections of this paper. The communications revolution has an impact on the way people interact internally within the House and in the two-way interaction between the House and the public.

**Internal communication.** The earlier description of the document management system indicates how communication technology facilitates the creation and exchange of congressional documents as they evolve and transit through the legislative process.

Networked systems also affect a wide range of other interactions within the House. Party leadership makes use of networked systems for communicating with their Members about pending issues, alerting them to upcoming votes, and announcing meetings. As the leadership and committee chairs increasingly rely on **email** for disseminating critical and time sensitive information, more pressure is placed on all Members to be connected to the House network and to be able to access quickly information that is being distributed. It also results in far less tolerance for technology breakdowns and greater requirements for systems that are easy to use and mobile. One might envision the use of electronic communications to establish more ad hoc groups of Members who share a common perspective on a given issue. Communications technology provides a mechanism for quickly assembling Members interested in cosponsoring legislation or forming a coalition to oppose or support a bill and then disseminating material reflecting their position.

Network communications eliminate the geographic and time barriers that traditionally limit interaction. Telecommuting is now permitted for some House staff, reducing the need for people to commute to Capitol Hill. The links between Washington, D.C. and district offices may be strengthened with communications networks enabling more effective collaboration and sharing of common databases. The potential for shifting work (and possibly staff) from Capitol Hill offices to district offices also increases. Will rules need to be altered to account for the fact that being physically present on Capitol Hill becomes less critical for conducting certain kinds of congressional business? One of the most significant implications of ubiquitous networking is the ability of Members to have continuous access to their offices and for staff to be able to interact with Members regardless of where they may be. Issues of verification of individuals and documents, as well as security of communications, are major issues in this context.

*External Communications.* Communication between Congress and the public has been dramatically altered by the use of the Internet and the World Wide Web. Almost every committee and Member now have Web pages that provide information to the public. While these pages vary considerably in their content, they generally contain basic information about the Member, the district, and key issues that the Member may be -championing. Sometimes they provide information about bills the Member has sponsored or provide links to other issue- oriented material. Members may use their Web pages as electronic newsletters, as a way to get input from their constituents, and as a way to promote public awareness of legislation under consideration. The widespread and varied use of Web pages by Members raises a number of questions about policy guidance for these activities. Should existing rules concerning franking privileges and limitations on newsletters apply to Web pages? Should the House establish rules that restrict use of Member or committee pages for lobbying purposes? How should majority and minority views be presented on committee Web sites? Should official sites of the Congress be non-partisan and restricted to congressional material?

Another unresolved issue is how Congress will respond to the growing constituent input they receive via **email**. Widespread use of **email** by the general public and its increasingly sophisticated deployment by interest groups create increased pressures on Congress. While the technology provides some mechanisms for identifying and filtering incoming messages, the volume of **email** remains a major challenge. Members lack the time or the resources to handle huge amounts of **email** and this fact has constrained many of them from engaging in **email** exchanges with constituents. The strong tradition of responsiveness to constituent inquiries is being challenged by the combined use of multiple communications advances, including phone bank calling, facsimile transmission, and **email**. How will these trends

affect the tension between representing constituent and district concerns versus supporting national causes? Will Members feel increasing pressure to respond immediately to public expressions on a given issue? Will the ability to poll constituents online affect how Members develop positions on pending legislation? Will the "democratization" of the process result in diminished party control and allegiance to leadership? As the public sees more of the internal workings of Congress in real time, how will the ability of Members to develop compromises and experiment with new approaches be affected?

### **Key Issues**

The continuing development of information technologies that have utility for the operations of the House will provide more opportunities to perform traditional tasks in new ways and challenges of maintaining the appropriate institutional culture. The implications for House rules and procedures are not yet fully apparent, but a number of potential issues warrant attention. These include:

- The increasing exposure of the internal workings of the House to a broad public via the Internet;
- The changing relationship between Members and their constituents resulting from electronic communication;
- The ability for Members to be in continuous communication regardless of their location;
- The reduction of paper versions of congressional documents and the increase in electronic and video versions;
- The reliance on electronic documents and their transmission over networks for conducting official business; and
- The accelerated pace of electronic document preparation and the reduced time for deliberation.

All of these trends raise questions that have possible ramifications for how the House deliberates in its committee and in the chamber; how the legislative record of the House is produced, distributed, and preserved; and how Congress interacts with the public.